# Immunization Update 2014

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Centers for Disease Control and Prevention

**WNY Pediatric and Adolescent and Adult Immunization Coalitions' 8th Annual Immunization Conference**

# Disclosures

- No financial conflict or interest with the manufacturer of any product named during this presentation.
- I will present recommendations for meningococcal conjugate vaccines (MCV4 and Hib-MenCY) and tetanus-toxoid, diphtheria-toxoid, acellular pertussis (Tdap) vaccine which conflict with the package insert

# Overview

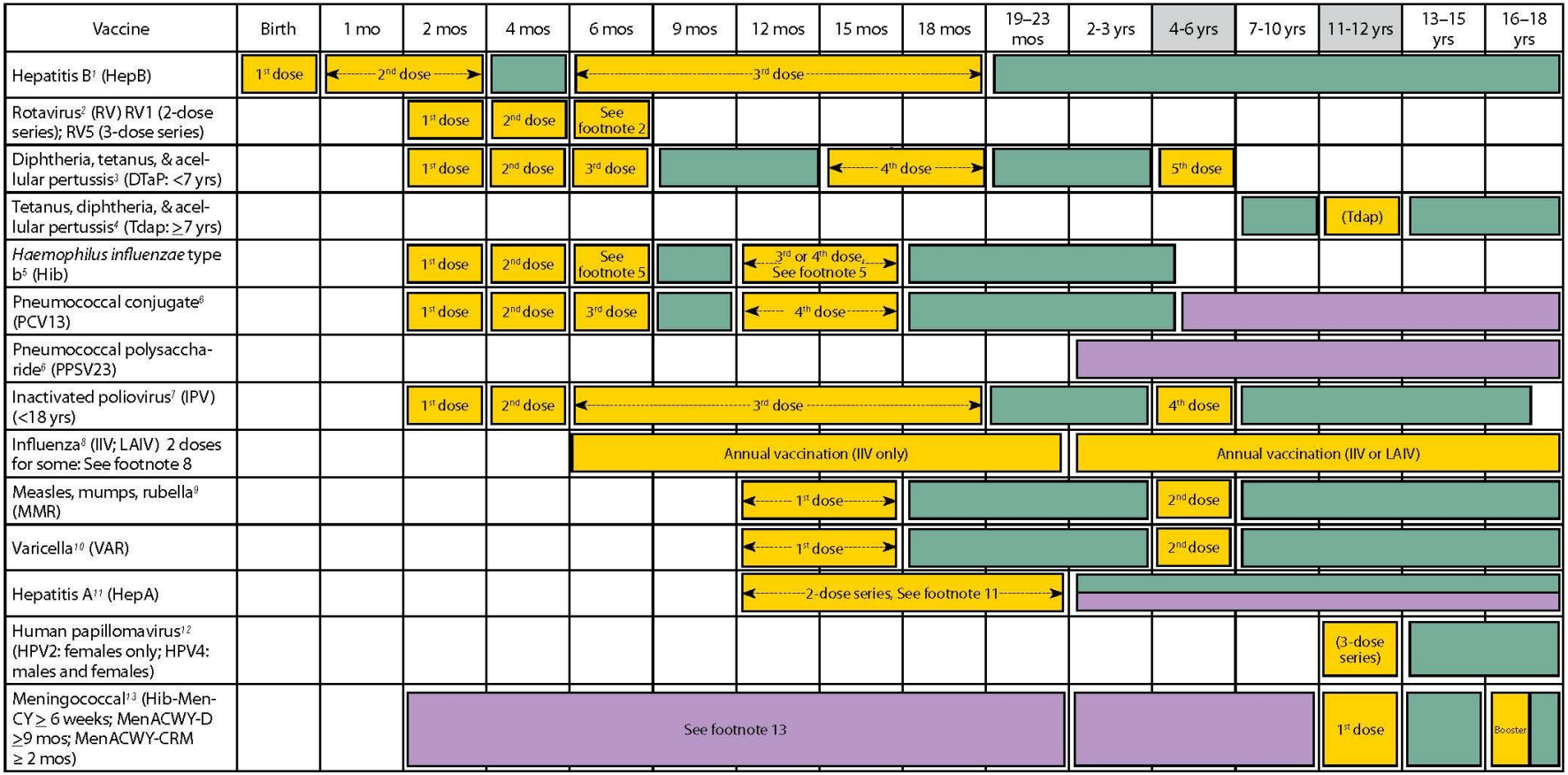
- 2014 Immunization schedule
- Hib recommendations
- MCV4 recommendations
- Pneumococcal vaccine recommendations
- MMR vaccine
- Tdap vaccine
- Storage and handling
- Vaccine administration

* Citations,

**Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2014.**

**(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).**

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.




Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

Range of recommended ages during which catch-up is encouraged and for certain high-risk groups

Not routinely recommended

This schedule includes recommendations in effect as of January 1, 2014. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://www.vaers.hhs.gov) or by telephone (800-822-7967).Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (http//www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

**NOTE:** The above recommendations must be read along with the footnotes of this schedule.

# Recommended Adult Immunization Schedule—United States - 2014

**Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.**

**Figure 1. Recommended adult immunization schedule, by vaccine and age group[1]**

| VACCINE ▼ / AGE GROUP ▶ | 19-21 years | 22-26 years | 27-49 years | 50-59 years | 60-64 years | ≥ 65 years |
|---|---|---|---|---|---|---|
| Influenza[2,*] | 1 dose annually | | | | | |
| Tetanus, diphtheria, pertussis (Td/Tdap)[3,*] | Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs | | | | | |
| Varicella[4,*] | 2 doses | | | | | |
| Human papillomavirus (HPV) Female[5,*] | 3 doses | | | | | |
| Human papillomavirus (HPV) Male[5,*] | 3 doses | | | | | |
| Zoster[6] | | | | | 1 dose | |
| Measles, mumps, rubella (MMR)[7,*] | 1 or 2 doses | | | | | |
| Pneumococcal 13-valent conjugate (PCV13)[8,*] | 1 dose | | | | | |
| Pneumococcal polysaccharide (PPSV23)[9,10] | 1 or 2 doses | | | | | 1 dose |
| Meningococcal[11,*] | 1 or more doses | | | | | |
| Hepatitis A[12,*] | 2 doses | | | | | |
| Hepatitis B[13,*] | 3 doses | | | | | |
| *Haemophilus influenzae* type b (Hib)[14,*] | 1 or 3 doses | | | | | |

*Covered by the Vaccine Injury Compensation Program

- For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster
- Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)
- No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

**Figure 2. Vaccines that might be indicated for adults based on medical and other indications[1]**

| VACCINE ▼ / INDICATION ► | Pregnancy | Immuno-compromising conditions (excluding human immunodeficiency virus [HIV])[4,6,7,8,15] | HIV infection CD4+ T lymphocyte count[4,6,7,8,15] | | Men who have sex with men (MSM) | Kidney failure, end-stage renal disease, receipt of hemodialysis | Heart disease, chronic lung disease, chronic alcoholism | Asplenia (including elective splenectomy and persistent complement component deficiencies)[8,14] | Chronic liver disease | Diabetes | Healthcare personnel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | < 200 cells/μL | ≥ 200 cells/μL | | | | | | | |
| Influenza[2,*] | 1 dose IIV annually | | | | 1 dose IIV or LAIV annually | 1 dose IIV annually | | | | | 1 dose IIV or LAIV annually |
| Tetanus, diphtheria, pertussis (Td/Tdap)[3,*] | 1 dose Tdap each pregnancy | Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs | | | | | | | | | |
| Varicella[4,*] | Contraindicated | | | 2 doses | | | | | | | |
| Human papillomavirus (HPV) Female[5,*] | | 3 doses through age 26 yrs | | | | 3 doses through age 26 yrs | | | | | |
| Human papillomavirus (HPV) Male[5,*] | | 3 doses through age 26 yrs | | | | 3 doses through age 21 yrs | | | | | |
| Zoster[6] | Contraindicated | | | 1 dose | | | | | | | |
| Measles, mumps, rubella (MMR)[7,*] | Contraindicated | | | 1 or 2 doses | | | | | | | |
| Pneumococcal 13-valent conjugate (PCV13)[8,*] | | 1 dose | | | | | | | | | |
| Pneumococcal polysaccharide (PPSV23)[9,10] | | 1 or 2 doses | | | | | | | | | |
| Meningococcal[11,*] | 1 or more doses | | | | | | | | | | |
| Hepatitis A[12,*] | 2 doses | | | | | | | | | | |
| Hepatitis B[13,*] | 3 doses | | | | | | | | | | |
| *Haemophilus influenzae* type b (Hib)[14,*] | | post-HSCT recipients only | | 1 or 3 doses | | | | | | | |

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

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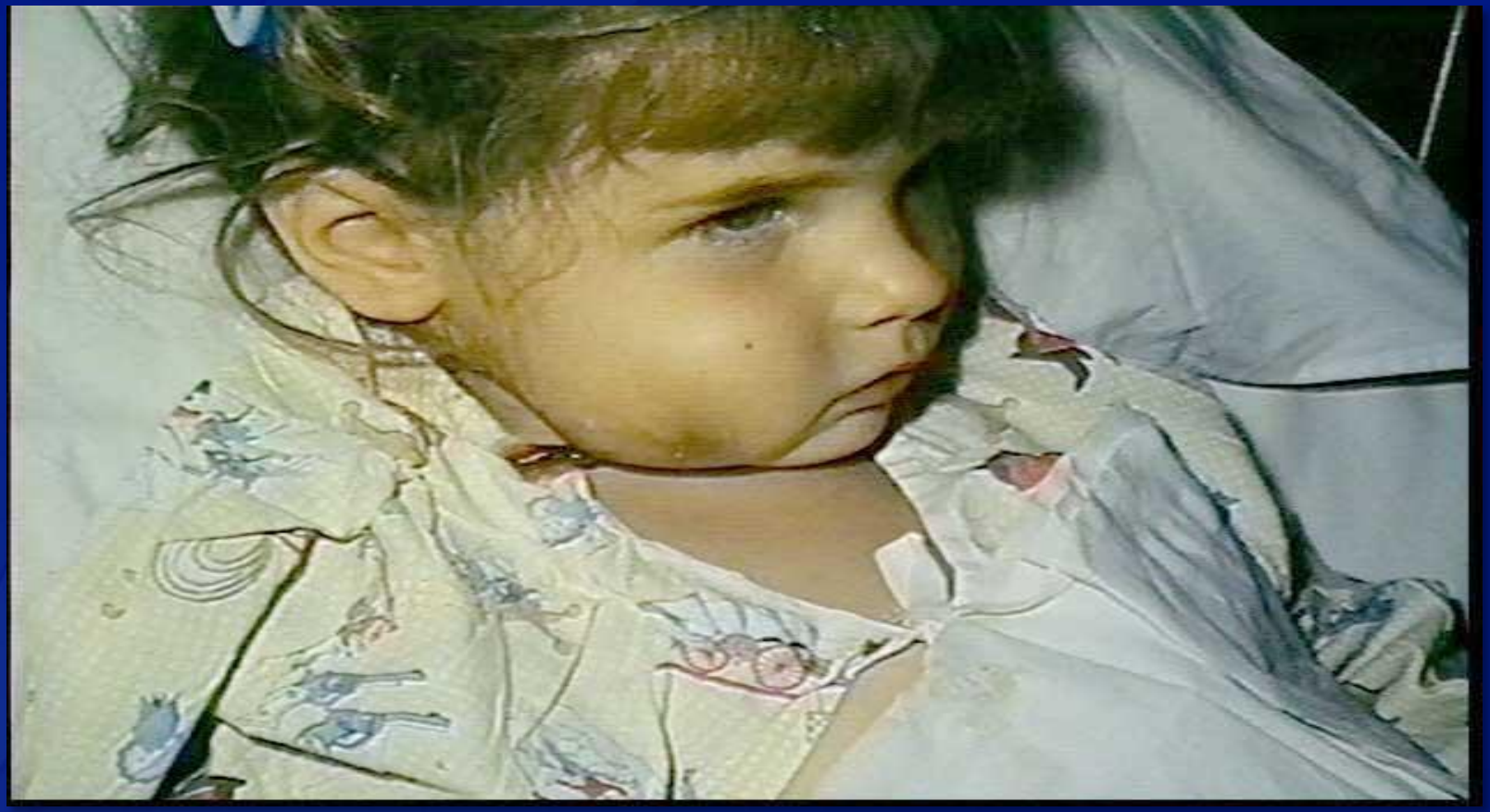
These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of February 1, 2014. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

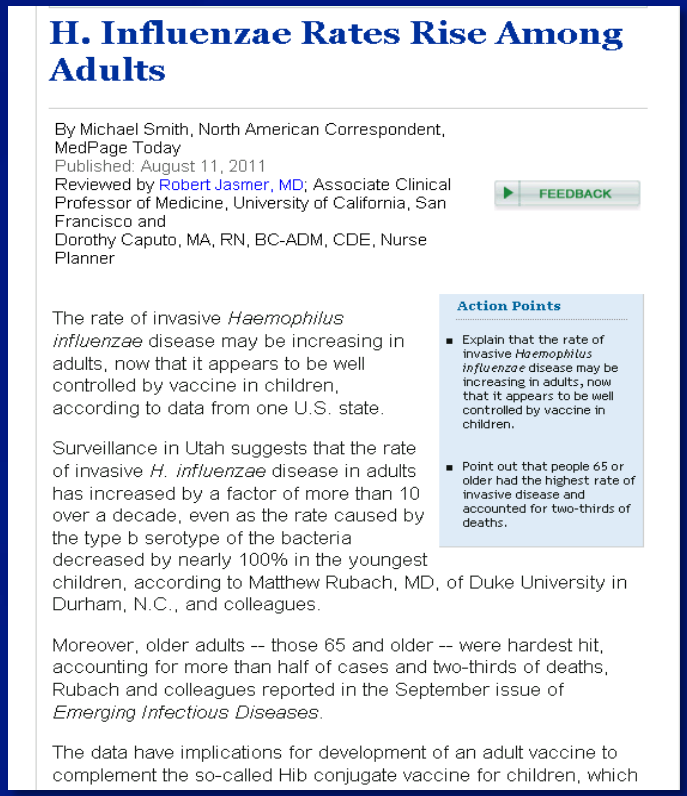
# *Haemophilus influenzae*



# Impact of *Haemophilus influenzae* type b disease

- Formerly the leading cause of bacterial meningitis among children younger than 5 years of age
- Approximately 1 in 200 children developed invasive Hib disease
- Almost all infections among children younger than 5 years

- **Uptick in disease among adults in Utah from 1998-2008**
  - 121 cases
  - persons 65 years of age and older
  - 51% of cases
  - 66% of Hib-related deaths
  - increase also in nontypeable Hib strains and in serotype f
  - increases have also been noted in Illinois, Alaska, and Spain
- **Reasons may include:**
  - changes in the organism
  - greater numbers of high-risk people
  - waning immunity to the organism



## H. Influenzae Rates Rise Among Adults

By Michael Smith, North American Correspondent, MedPage Today
Published: August 11, 2011
Reviewed by Robert Jasmer, MD; Associate Clinical Professor of Medicine, University of California, San Francisco and
Dorothy Caputo, MA, RN, BC-ADM, CDE, Nurse Planner

FEEDBACK

**Action Points**

- Explain that the rate of invasive *Haemophilus influenzae* disease may be increasing in adults, now that it appears to be well controlled by vaccine in children.
- Point out that people 65 or older had the highest rate of invasive disease and accounted for two-thirds of deaths.

The rate of invasive *Haemophilus influenzae* disease may be increasing in adults, now that it appears to be well controlled by vaccine in children, according to data from one U.S. state.

Surveillance in Utah suggests that the rate of invasive *H. influenzae* disease in adults has increased by a factor of more than 10 over a decade, even as the rate caused by the type b serotype of the bacteria decreased by nearly 100% in the youngest children, according to Matthew Rubach, MD, of Duke University in Durham, N.C., and colleagues.

Moreover, older adults -- those 65 and older -- were hardest hit, accounting for more than half of cases and two-thirds of deaths, Rubach and colleagues reported in the September issue of *Emerging Infectious Diseases*.

The data have implications for development of an adult vaccine to complement the so-called Hib conjugate vaccine for children, which

# Updates to Hib Footnotes

- **High-risk Hib vaccine for young children**
  - 15-59 months of age
  - Vaccinate with 2 doses if unvaccinated or only 1 dose prior to 12 months of age, for Ig deficiency, complement deficiency, anatomic/functional asplenia, chemotherapy recipients and HIV infection
  - Vaccinate with 1 dose if no primary series/booster or no doses after 14 months of age, for those undergoing elective splenectomy vaccine to be given 14 days before splenectomy

# Updates to Hib Footnotes

- **High-risk Hib vaccine for older children/adults**
  - 5 years to 18 years

    Vaccinate with 1 dose if no primary series/booster or no doses after 14 months of age, for those with anatomic/functional asplenia, chemotherapy recipients and HIV infection
  - Adults

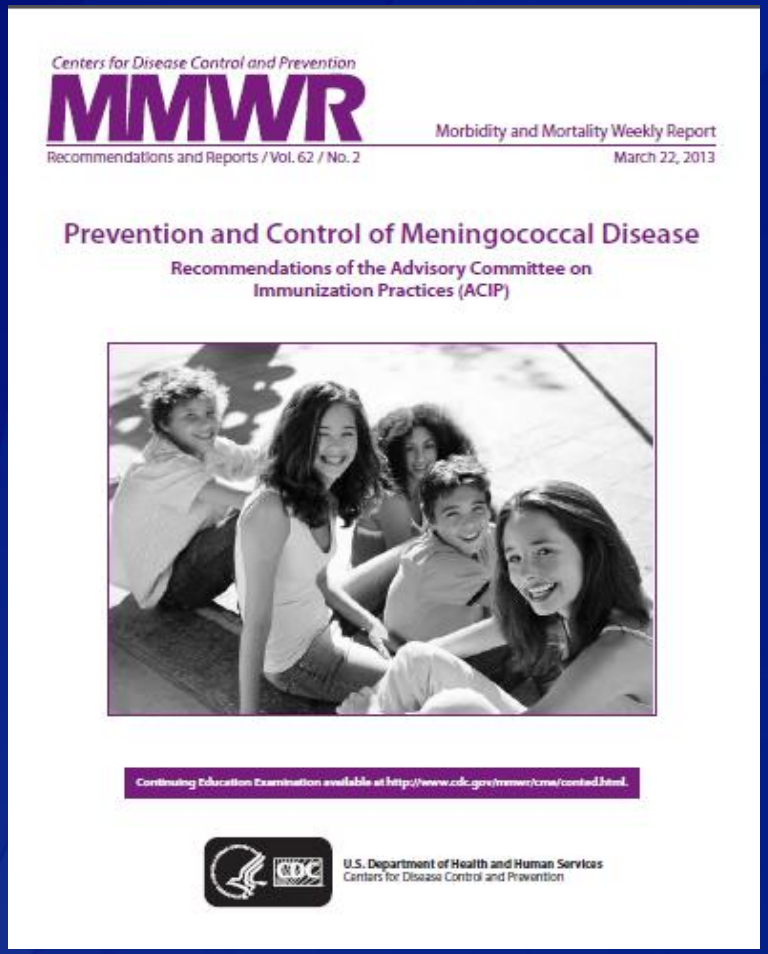
    1 dose of Hib vaccine should be administered to persons who have functional or anatomic asplenia, sickle cell disease, or are undergoing elective splenectomy, if they have not previously received Hib vaccine. Hib vaccination 14 or more days before splenectomy is suggested.

    For Hib vaccine guidance recommended that Hib vaccination of persons infected with human immunodeficiency (HIV) be considered, but updated guidance no longer recommends Hib vaccination of previously unvaccinated adults with HIV infection because their risk for Hib infection is low.

# Hib Recommendations Hematopoietic Cell Transplant Recipients

- Recipients of hematopoietic stem cell transplant (Adults who have had a successful hematopoietic stem cell transplant are recommended to receive a 3-dose series of Hib vaccine 6–12 months after transplant regardless of prior Hib vaccination.

# MENINGOCOCCAL VACCINES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MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 62 / No. 2 March 22, 2013

Prevention and Control of Meningococcal Disease

Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Continuing Education Examination available at http://www.cdc.gov/mmwr/cme/conted.html.

U.S. Department of Health and Human Services
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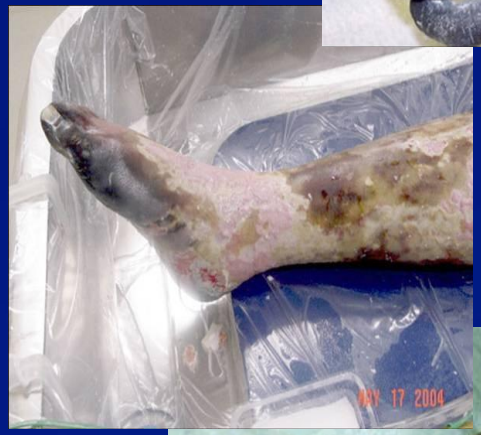


http://www.cdc.gov/mmwr/PDF/rr/rr6202.pdf

# Comparing Meningococcal Vaccines

| | Meningococcal Polysaccharide (Menomune) | Meningococcal Conjugate | | Meningococcal Conjugate & Haemophilus *influenzae type b* |
|---|---|---|---|---|
| | | (Menactra) | (Menveo) | |
| **Ages** | 2 years and older | 9 months through 55 years | 2 months through 55 years | 6 weeks through 18 months |
| **Abbrev** | MPSV4 | MCV4 or MenACWY | | Hib-MenCY |
| **Route** | Subcutaneous (Subcut.) | Intramuscular (IM) | | |

# Routine MCV4 Vaccination for Persons 11 through 21 Years of Age

| Age Group | Primary Vaccination | Booster Dose* |
|---|---|---|
| 11-12 years | 1 dose | 1 dose recommended if first dose administered before 16th birthday |
| 13-18 years | 1 dose if not vaccinated previously | |
| 19-21 years | Not routinely recommended but 1 dose may be administered as catch-up vaccination for those who have not received a dose after their 16th birthday | |

*ACIP off-label recommendation

# Meningococcal Vaccination for Infants 2 through 18 months of Age at Increased Risk

| Risk Group | Primary Vaccination |
| --- | --- |
| Persistent complement deficiencies<br><br>Functional or anatomic asplenia, including sickle cell<br><br>Risk during a community outbreak attributable to a vaccine serogroup | 4 doses of Hib-MenCY at 2, 4, 6, and 12–15 months<br>4 doses of MCV4-CRM at 2,4,6, and 12-15 months<br><br>*If later travel to an area where A and W-135 protection are needed, administer an age-appropriate MCV4 dose prior to travel |

# Meningococcal Vaccination for Children 9 through 23 months of Age at Increased Risk

| Risk Group | Primary Vaccination |
| --- | --- |
| Persistent complement deficiencies<br><br>Travel to or resident of countries where meningococcal disease is hyperendemic or endemic<br><br>Risk during a community outbreak attributable to a vaccine serogroup | 2 doses of MCV4, 12 weeks apart<br>*8 weeks apart if needed for travel<br>8 weeks for catch-up for MCV4 and Hib-MenCY<br><br>**Because of high risk for IPD, children with functional or anatomic asplenia should not be immunized with Menactra before 2 years of age to avoid interference with the immune response to PCV series |

# Meningococcal Vaccination for Persons 2 through 55 Years of Age at Increased Risk and Not Previously Vaccinated

| Risk Group | Primary Vaccination |
| --- | --- |
| Persistent complement deficiencies<br><br>Functional or anatomic asplenia, including sickle cell<br><br>HIV+, if another indication for vaccination exists | 2 doses of MCV4, 8 to 12 weeks apart<br><br>*If Menactra is used, it should be administered at least 4 weeks after completion of all PCV doses |

*ACIP off-label recommendation

# Meningococcal Vaccination for Persons 2 through 55 Years of Age at Increased Risk and Not Previously Vaccinated

| Risk Group | Primary Vaccination |
| --- | --- |
| First year college students 21 yrs of age or younger living in residential housing<br><br>Travel to or resident of countries where meningococcal disease is hyper endemic or endemic<br><br>Risk during a community outbreak attributable to a vaccine serogroup<br><br>Microbiologists routinely exposed to isolates of Neisseria meningitidis | 1 dose of MCV4<br><br>*If Menactra is used, it should be administered at least 4 weeks after completion of all PCV doses. |

*ACIP off-label recommendation

# Meningococcal Vaccination of High-Risk Persons 56 Years of Age and Older

- MPSV4 is only licensed vaccine for persons in this age group
- MPSV4 is preferred for meningococcal vaccine-naïve persons aged 56 years and older who anticipate requiring a single dose of meningococcal vaccine (e.g., travelers and persons at risk as a result of a community outbreak
- *For persons now aged 56 years of age and older who were vaccinated previously with MCV4 and are recommended for revaccination or for whom multiple doses are anticipated (e.g., persons with asplenia and microbiologists), MCV4* is preferred*

*ACIP off-label recommendation
http://www.cdc.gov/mmwr/PDF/rr/rr6202.pdf

# PNEUMOCOCCAL VACCINES

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Morbidity and Mortality Weekly Report (*MMWR*)

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## Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine for Adults with Immunocompromising Conditions: Recommendations of the Advisory Committee on Immunization Practices (ACIP)

*Weekly*
**October 12, 2012 / 61(40);816-819**

On June 20, 2012, the Advisory Committee on Immunization Practices (ACIP) recommended routine use of 13-valent pneumococcal conjugate vaccine (PCV13; Prevnar 13, Wyeth Pharmaceuticals, Inc., a subsidiary of Pfizer, Inc.) for adults aged ≥19 years with immunocompromising conditions, functional or anatomic asplenia, cerebrospinal fluid (CSF) leaks, or cochlear implants (Table). PCV13 should be administered to eligible adults in addition to the 23-valent pneumococcal polysaccharide vaccine (PPSV23; Pneumovax 23, Merck & Co. Inc.), the vaccine currently recommended for these groups of adults (*1*). The evidence for the benefits and risk of PCV13 vaccination of adults with immunocompromising conditions was evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework and designated as a Category A recommendation (*2,3*). This report outlines the new ACIP recommendations for PCV13 use; explains the recommendations for the use of PCV13 and PPSV23 among adults with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants; and summarizes the evidence considered by ACIP to make its recommendations.

**Epidemiology of Pneumococcal Infection in Immunocompromised Adults**

*Streptococcus pneumoniae* (pneumococcus) remains a leading cause of serious illness, including bacteremia, meningitis, and pneumonia among adults in the United States. An estimated 4,000 deaths occur in the United States each year because of *S. pneumoniae*, primarily among adults (*4*). The incidence of invasive disease ranges from 3.8 per 100,000 among persons aged 18–34 years to 36.4 per 100,000 among those aged ≥65 years (*4*). Adults with certain medical conditions also are at increased risk for invasive pneumococcal disease (IPD). For adults aged 18–64 years with hematologic cancer, the rate of IPD in 2010 was 186 per 100,000, and for persons with human immunodeficiency virus (HIV) the rate was 173 per 100,000 (CDC, unpublished data, 2012). The disease rates for adults in these groups can be more than 20 times those for adults without high-risk medical conditions.

PCV13 has been used for children since 2010, when it replaced an earlier version targeting seven serotypes (PCV7; Prevnar, Pfizer) that had been in use since 2000. The routine use of PCV7 in infants and young children resulted in significant reductions in IPD caused by vaccine serotypes in children, and because of indirect effects, also in adults. Rates of IPD caused by vaccine serotypes in adults aged 18–64 years without HIV decreased from six cases to one case per 100,000 during 2000–2007. However, even after indirect effects of the pediatric immunization had been realized fully, the incidence of IPD caused by the serotypes included in PCV7 remained high in HIV-infected persons aged 18–64 years at 64 cases per 100,000 persons with acquired immunodeficiency syndrome (AIDS) (*5*). Moreover, 50% of IPD cases among immunocompromised adults in 2010 were caused by serotypes contained in PCV13; an additional 21% were

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Morbidity and Mortality Weekly Report (*MMWR*)

*MMWR*

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## Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23)

*Weekly*
**September 3, 2010 / 59(34);1102-1106**

Invasive disease from *Streptococcus pneumoniae* (pneumococcus) is a major cause of illness and death in the United States, with an estimated 43,500 cases and 5,000 deaths among persons of all ages in 2009 (*1*). This report provides updated recommendations from the Advisory Committee on Immunization Practices (ACIP) for prevention of invasive pneumococcal disease (IPD) (i.e., bacteremia, meningitis, or infection of other normally sterile sites [*2*]) through use of the 23-valent pneumococcal polysaccharide vaccine (PPSV23) among all adults aged ≥65 years and those adults aged 19--64 years with underlying medical conditions that put them at greater risk for serious pneumococcal infection. The new recommendations include the following changes from 1997 ACIP recommendations (*2*): 1) the indications for which PPSV23 vaccination is recommended now include smoking and asthma, and 2) routine use of PPSV23 is no longer recommended for Alaska Natives or American Indians aged <65 years unless they have medical or other indications for PPSV23. ACIP recommendations for revaccination with PPSV23 among the adult patient groups at greatest risk for IPD (i.e., persons with functional or anatomic asplenia and persons with immunocompromising conditions) remain unchanged (*2*). ACIP recommendations for prevention of pneumococcal disease among infants and youths aged ≤18 years using the 13-valent pneumococcal conjugate vaccine (PCV13) and PPSV23 are published separately (*3*).

**Changes in IPD Incidence**

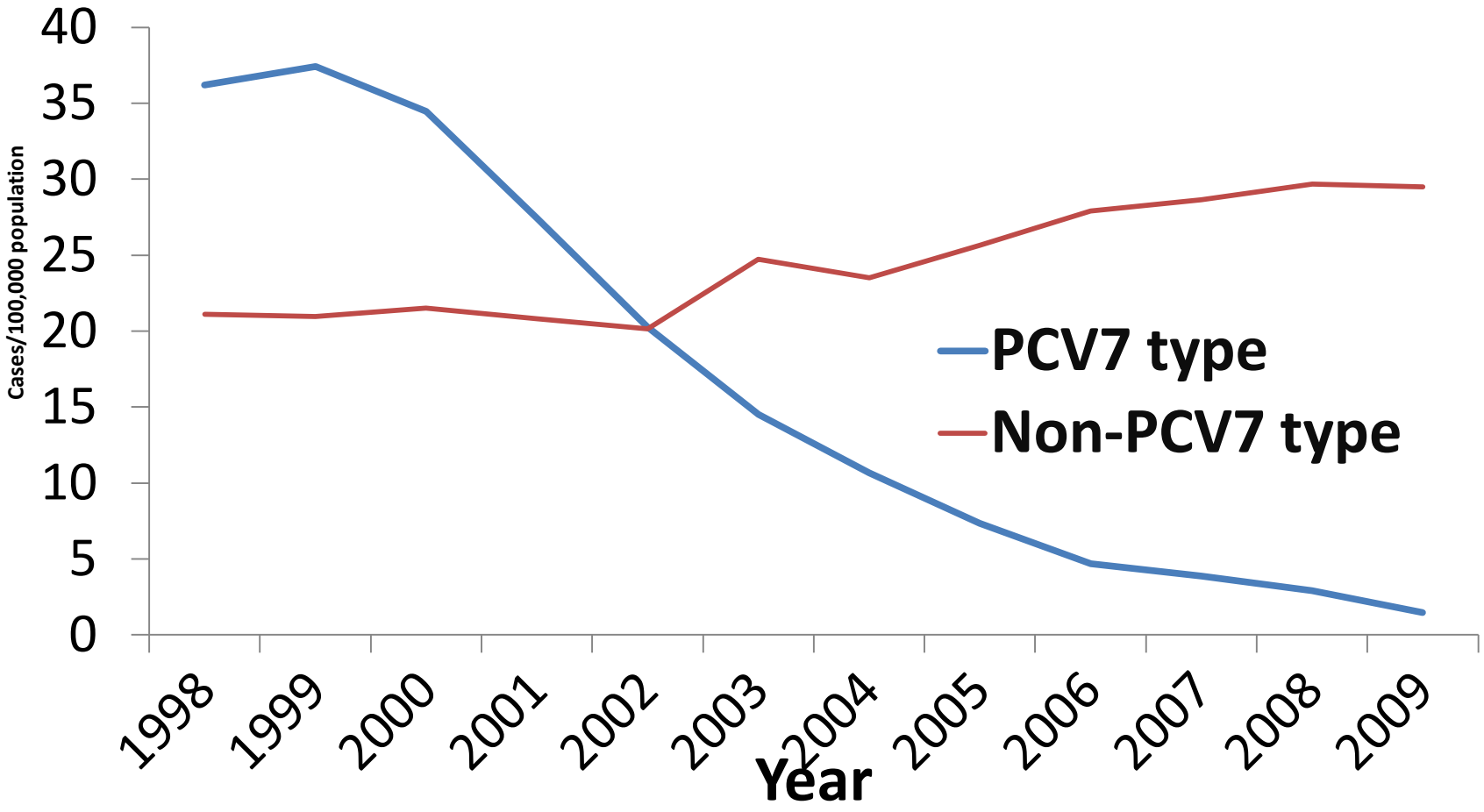
Indirect vaccine effects (i.e., herd effects) have reduced pneumococcal infections among unvaccinated persons of all ages, including those aged ≥65 years, since introduction of the routine infant 7-valent pneumococcal conjugate vaccine (PCV7) immunization program in 2000 (*4*). Data from Active Bacterial Core surveillance (ABCs)* indicate that, by 2007, the overall incidence rate of IPD among persons of all ages had decreased by 45% (from 24.4, to 13.5 per 100,000 population), compared with 1998--1999 before PCV7 was introduced (*4*). Among persons aged 18--49 years, 50--64 years, and ≥65 years, rates of IPD decreased 40%, 18%, and 37%, respectively. The decreases resulted from reductions of 87% to 92% in cases of infection with serotypes covered in PCV7 (*4*). Despite the major direct and indirect PCV7 effects, IPD remains an important cause of illness and death. An estimated 43,500 cases and 5,000 deaths occurred among persons of all ages in 2009; approximately 84% of IPD cases and nearly all deaths occurred in adults (*1*).

Additional indirect effects can be expected to occur when the PCV13 immunization program, initiated in 2010, is fully implemented, although the magnitude of these effects is difficult to predict (*3*). In 2008, the serotypes covered in PCV13 caused 53%, 49%, and 44% of IPD cases among persons aged 18--49 years, 50--64 years, and ≥65 years, respectively; serotypes covered in PPSV23 caused 78%, 76%, and 66% of IPD cases among persons in these age groups (Figure).

**Risk Factors for IPD Among Adults**

http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#pcv

# Incidence of Invasive Pneumococcal Disease Among Children <5 Years by Serotype, 1998-2009

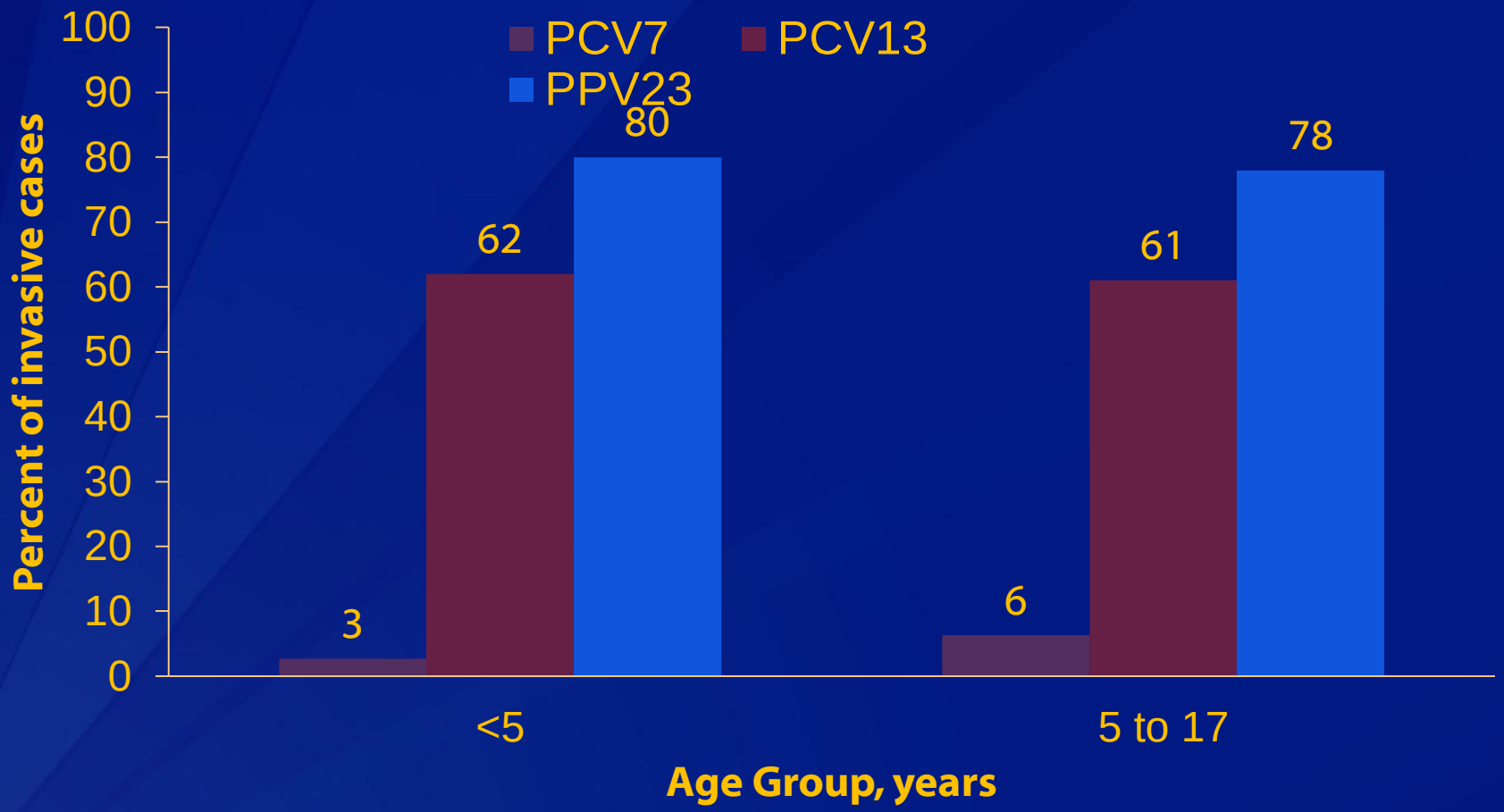



ABCs unpublished data, continuous sites

# Risk Factors for Invasive Pneumococcal Disease

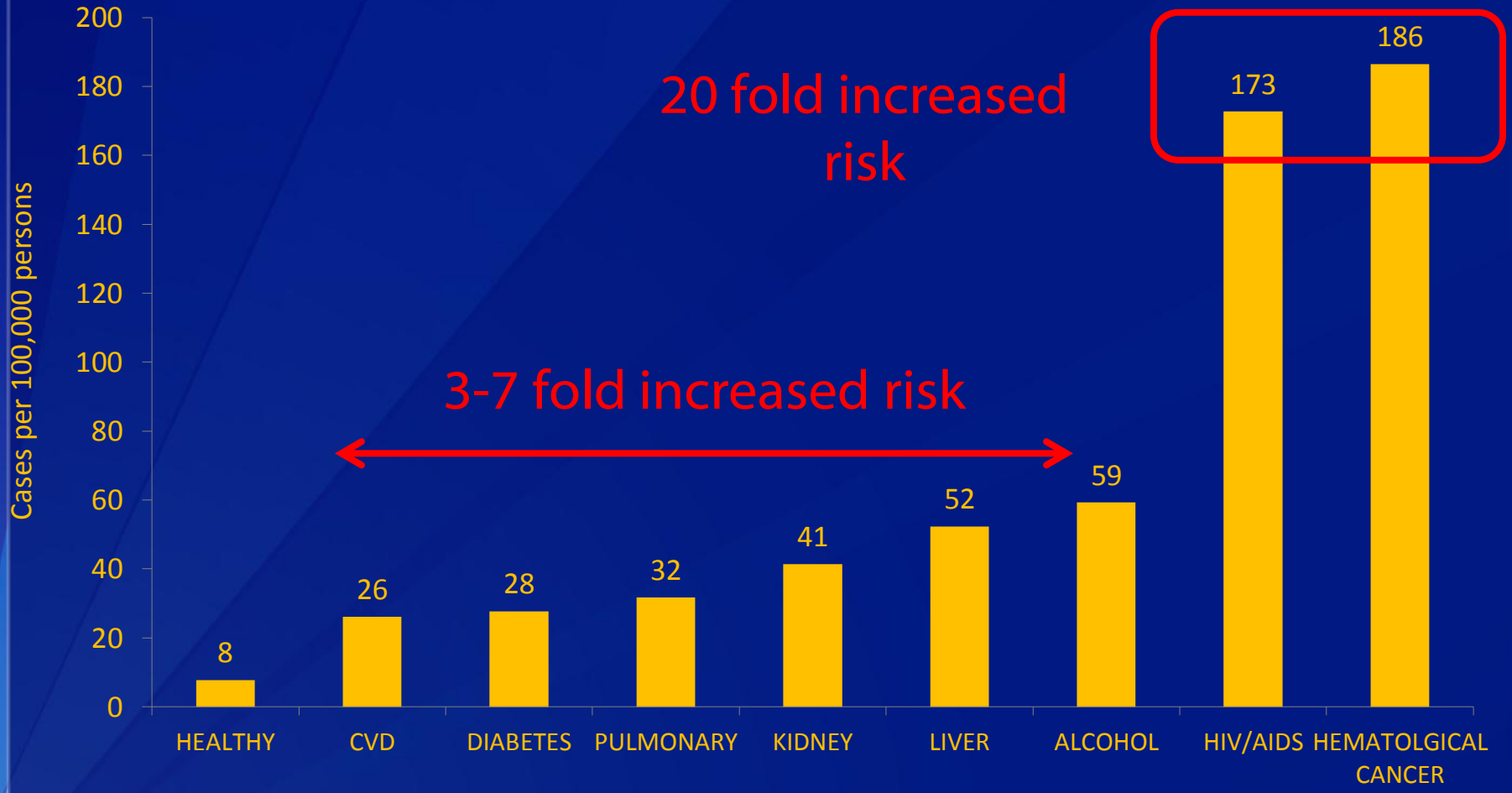
- Functional or anatomic asplenia
- Immunosuppression
- Renal disease
- CSF leak
- Cochlear implants
- Chronic disease
- Cardiovascular
- Pulmonary (including asthma over 19 years of age)
- Metabolic
- Liver
- Alcoholism
- Cigarette smoking over 19 years of age
- Resident of nursing home

# Percent of Invasive Pneumococcal Cases Caused by Serotypes in Different Vaccine Formulations, 2009




•ABCs unpublished data, 2006-2008

# Incidence of IPD in Adults Aged 18-64 Years with Selected Underlying Conditions, US, 2009




Kyaw, JID 2005;192:377-86 & CDC Unpublished

# Comparing Pneumococcal Vaccines

| | Pneumococcal Polysaccharide (Pneumovax 23) | Pneumococcal Conjugate (Prevnar 13) |
|---|---|---|
| **Ages** | 2 years and older (high-risk only) | 6 weeks and older* |
| **Abbreviation** | PPSV23 | PCV13 |
| **Route** | Intramuscular (IM) or Subcutaneous (Subcut.) | Intramuscular (IM) |

*ACIP off-label recommendation

# PCV13 for Children Birth through 18 Years of Age

- Four doses of PCV13 at 2, 4, 6 months and a booster at 12 through 15 months
  - Catch up per catch-up schedule
    - 4-week minimum interval between primary doses
    - 8-week interval between last primary dose and booster and minimum of 12 months of age
- One supplemental dose for children 14 through 59 months who have received an age-appropriate series of PCV7

# PCV13 for Children
# Birth through 18 Years of Age

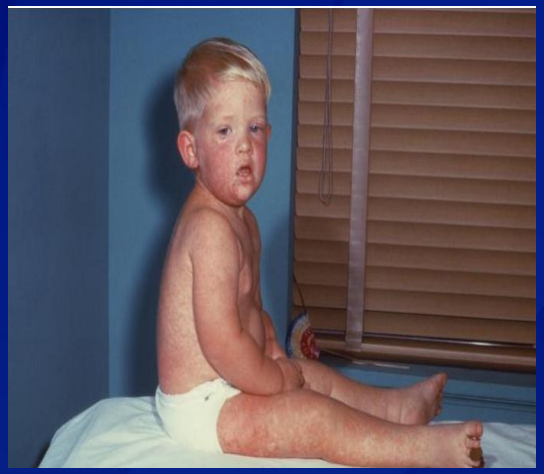
- One dose for high-risk children 6 through 18* years who have not received PCV13
  - asplenia
    - functional or anatomic, sickle cell
  - immunocompromised
    - congenital or acquired from disease or treatment
    - chronic renal failure
    - nephrotic syndrome
    - solid organ transplant
    - HIV
  - cerebrospinal fluid leak
  - cochlear implant

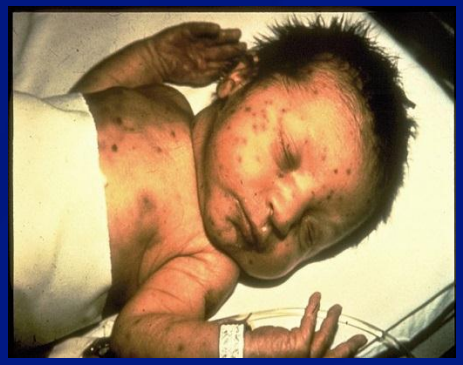
# PPSV23 for High-Risk Children 2 through 18 Years

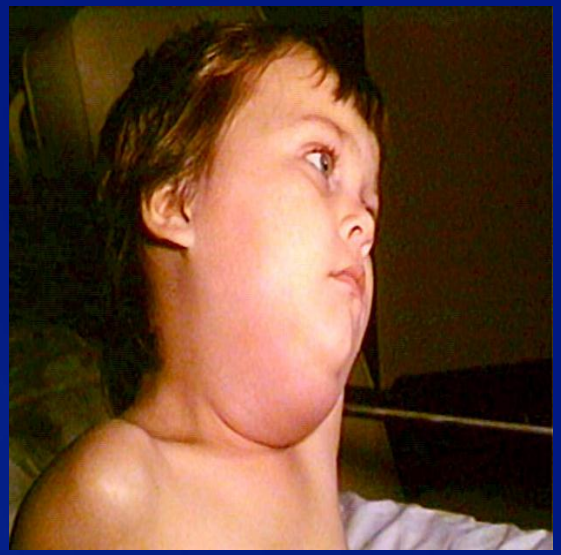
- One dose of PPSV23 at least 8 weeks after the last dose of PCV13 to children 2 years or older with:
  - chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure)
  - chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy)
  - diabetes mellitus
  - cerebrospinal fluid leaks
  - cochlear implant
  - anatomic or functional asplenia (including sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction)
  - immunocompromising conditions
- One revaccination PPSV23 dose 5 years after first dose for children with:
  - anatomic or functional asplenia (including sickle cell disease)
  - an immunocompromising condition

http://www.cdc.gov/mmwr/pdf/wk/mm6225.pdf

# Measles-Mumps-Rubella Vaccine







# Measles Outbreaks and Cases (April 18)

- **Clustered on both coasts (NYC and California)**
- **More cases in first quarter of 2014 since 1996**
  - CA – 58
  - WA – 13
  - NY - 24
- **34 known importations – half from Philippines**

# MMR and Infant Travelers

- A dose of MMR is recommended for infants 6 months through 11 months if they are traveling internationally
- One dose recommended
- The dose does NOT count as one of the two doses in the series

# New MMR Recommendations –

- **Children with HIV**
  - Recommended age for 2nd dose – 4 – 6 years
  - Definition of severe immunosuppression
  - Recommendations for Children with perinatal HIV who received MMR vaccine before combination Anti-retroviral Therapy (cART)
- **General criteria of immune/susceptible – adults**
- **Recommendation for use of passive immunobiologics**

# Severe Immunosuppression

- **ABSENCE OF SEVERE IMMUNOSUPPRESSION**
- **Children 5 years old or younger**
  - CD4 T-lymphocyte percentage ≥ 15 for 6 months or longer

    preferred metric
  - CD4 T-lymphocyte counts above sliding scale parameters for 6 months or longer (value varies by age (see text for details))
- **Persons older than 5 years**
  - CD4 T-lymphocyte count greater than 200 cells/$mm^3$ for 6 months or longer

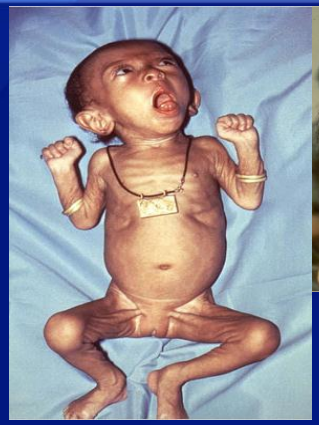
    Preferred metric
  - CD4 T-lymphocyte percentage ≥ 15 for 6 months or longer

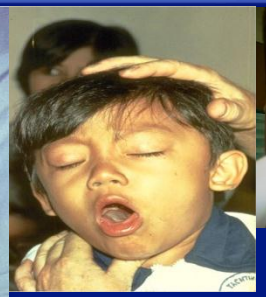
www.cdc.gov/mmwr/pdf/rr/rr6204.pdf

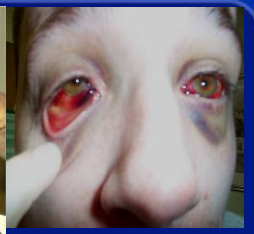
# Revaccination with MMR

- **A revaccination dose of MMR vaccine should be given to children infected with HIV in the perinatal period who received MMR vaccine before establishment of combined Anti-retroviral Therapy (cART)**
- **Use the same parameters for absence of severe immunosuppression**
  - Add 6 months of cART therapy prior to revaccination

# PERTUSSIS VACCINATION FOR 7 YEARS AND OLDER







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Morbidity and Mortality Weekly Report (*MMWR*)

*MMWR*

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## Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccine (Tdap) in Pregnant Women — Advisory Committee on Immunization Practices (ACIP), 2012

*Weekly*

**February 22, 2013 / 62(07);131-135**

In October 2011, in an effort to reduce the burden of pertussis in infants, the Advisory Committee on Immunization Practices (ACIP) recommended that unvaccinated pregnant women receive a dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) (*1*). Vaccination of women with Tdap during pregnancy is expected to provide some protection to infants from pertussis until they are old enough to be vaccinated themselves. Tdap given to pregnant women will stimulate the development of maternal antipertussis antibodies, which will pass through the placenta, likely providing the newborn with protection against pertussis in early life, and will protect the mother from pertussis around the time of delivery, making her less likely to become infected and transmit pertussis to her infant (*1*). The 2011 Tdap recommendation did not call for vaccinating pregnant women previously vaccinated with Tdap. On October 24, 2012, ACIP voted to recommend use of Tdap during every pregnancy. This report summarizes data considered and conclusions made by ACIP and provides guidance for implementing its recommendations. These updated recommendations on use of Tdap in pregnant women aim to optimize strategies for preventing pertussis morbidity and mortality in infants.

The United States has experienced substantial increases in reported pertussis cases over the past several years. Provisional case counts for 2012 have surpassed the last peak year, 2010, with 41,880 pertussis cases and 14 deaths in infants aged <12 months (*2*) (CDC, unpublished data, 2012). To reduce this burden, optimizing the current vaccination program and protecting infants who are at highest risk for death are immediate priorities. Since the 2011 ACIP vaccination recommendation, uptake of Tdap among pregnant women has been low; one survey of 1,231 women (August 2011 to April 2012) estimated that only 2.6% of women received Tdap during their recent pregnancy (*3*). New data indicate that maternal antipertussis antibodies are short-lived; therefore, Tdap vaccination in one pregnancy will not provide high levels of antibodies to protect newborns during subsequent pregnancies (*4*).

**Methods**

In monthly teleconferences during 2012, the ACIP Pertussis Vaccines Work Group considered published, peer-reviewed literature and unpublished data relevant to vaccinating pregnant women with Tdap. When data were not available, expert opinion was considered. Summaries of the data reviewed and work group discussions were presented to ACIP before recommendations were proposed. The proposed Tdap recommendation for pregnant women was presented at the October 2012 ACIP meeting and approved by ACIP.

**Summary of ACIP Deliberations and Rationale**

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Morbidity and Mortality Weekly Report (*MMWR*)

*MMWR*

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## Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine from the Advisory Committee on Immunization Practices, 2010

*Weekly*

**January 14, 2011 / 60(01);13-15**

Despite sustained high coverage for childhood pertussis vaccination, pertussis remains poorly controlled in the United States. A total of 16,858 pertussis cases and 12 infant deaths were reported in 2009 (*1*; CDC, unpublished data, 2009). Although 2005 recommendations by the Advisory Committee on Immunization Practices (ACIP) called for vaccination with tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) for adolescents and adults to improve immunity against pertussis, Tdap coverage is 56% among adolescents and <6% among adults (*2,3*). In October 2010, ACIP recommended expanded use of Tdap. This report provides the updated recommendations, summarizes the safety and effectiveness data considered by ACIP, and provides guidance for implementing the recommendations.

ACIP recommends a single Tdap dose for persons aged 11 through18 years who have completed the recommended childhood diphtheria and tetanus toxoids and pertussis/diphtheria and tetanus toxoids and acellular pertussis (DTP/DTaP) vaccination series and for adults aged 19 through 64 years (*4,5*). Two Tdap vaccines are available in the United States. Boostrix (GlaxoSmithKline Biologicals, Rixensart, Belgium) is licensed for use in persons aged 10 through 64 years, and Adacel (Sanofi Pasteur, Toronto, Canada) is licensed for use in persons aged 11 through 64 years. Both Tdap products are licensed for use at an interval of at least 5 years between the tetanus and diphtheria toxoids (Td) and Tdap dose. On October 27, 2010, ACIP approved the following additional recommendations: 1) use of Tdap regardless of interval since the last tetanus- or diphtheria-toxoid containing vaccine, 2) use of Tdap in certain adults aged 65 years and older, and 3) use of Tdap in undervaccinated children aged 7 through 10 years.

The Pertussis Vaccines Working Group of ACIP reviewed published and unpublished Tdap immunogenicity and safety data from clinical trials and observational studies on use of Tdap. The Working Group also considered the epidemiology of pertussis, provider and program feedback, and data on the barriers to receipt of Tdap. The Working Group then presented policy options for consideration to the full ACIP. These additional recommendations are intended to remove identified barriers and programmatic gaps that contribute to suboptimal vaccination coverage. An important barrier that limited vaccination of persons with Tdap was unknown history of Td booster. Programmatic gaps included lack of a licensed Tdap vaccine for children aged 7 through 10 years and adults aged 65 years and older. In light of the recent increase of pertussis in the United States, the additional recommendations are made to facilitate use of Tdap to reduce the burden of disease and risk for transmission to infants (Box).

**Timing of Tdap Following Td**

http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#tdap

# General Principles for Use of Tdap

- Previously unvaccinated persons: Tdap preferred to Td to provide protection against pertussis
- Tdap is approved by FDA for a single booster dose
  - NOT recommended for multiple administrations except for pregnant women*
  - Tdap may be used for wound prophylaxis
- No minimum interval between the last dose of tetanus toxoid-containing vaccine and a dose of Tdap
- If possible, Boostrix should be used for adults 65 years of age and older
  - administer Adacel* if Boostrix is not available

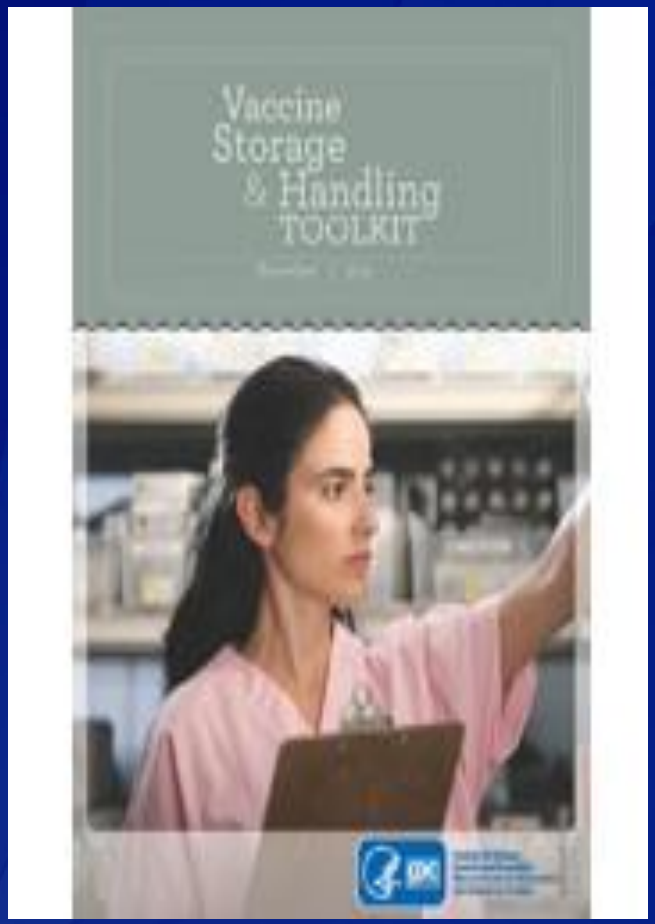
*ACIP off-label recommendation

# Tdap Recommendations

- Children 7 through 10 years who are not "fully vaccinated against pertussis"*
- Routinely at 11 or 12 years of age
- Catch up teens 13 through 18 years who have not been vaccinated with Tdap
- Unvaccinated adults 19 years and older

*ACIP off-label recommendation

## Storage and Handling




- **CDC recommends vaccines be stored in stand-alone refrigerator and freezer units rather than combination units**
  - The refrigerator compartment of a combination unit may be used to store refrigerated vaccines and a separate freezer unit to store frozen vaccines
- **Storage units should have**
  - Enough room to store the year's largest inventory without crowding;
  - Sufficient room to store water bottles (refrigerator) or frozen coolant packs (freezer);
  - Frost free or automatic defrost units are preferred

www.cdc.gov/vaccines/recs/storage/toolkit/default.htm

# Storage and Handling Practices

- Storage unit temperatures should be read and documented twice each workday
- The min/max temperature should be read and documented once per workday preferably in the morning
- Stored temperature monitoring data should be downloaded and reviewed weekly
- Weekly review of vaccine expiration dates and rotation of vaccine stock

# Thank You

**Email:** nipinfo@cdc.gov

**CDC-INFO Website** www.cdc.gov/info

**Website:** www.cdc.gov/vaccines